

Natarajan Ganesan

2001 N Adams St #432

Arlington, VA 22201

703.851.4371

ng6@georgetown.edu

<http://www.georgetown.edu/faculty/ng6>

SUMMARY

- Molecular Biophysicist/biochemist with research experience in structural biophysics, bioinformatics and biosensors & nanomedicine.
- Contributing authority, Science's STKE – TGF signaling pathways; Editor – HTRB (<http://htrb.georgetown.edu>).
- Panel member in Grant review committees.

PROFESSIONAL APPOINTMENTS

At Georgetown University, Washington, DC:

Research Faculty – Dept of Surgery, Mutational analysis of TGF signaling pathway in HCC patients, Contributing authority – Science's STKE (peer reviewed submissions)

Research Faculty – Coordinator - Bioinformatics & Computational Biosciences Unit. ■ 2004 - (<http://bioinformatics.georgetown.edu>)

- Course Director – COSC 430 Computational Biosciences (4.0/5/0 – course evaluation)

- [SEQUEROME](#) - Web based sequence alignment tool for DNA/RNA proteins – Mentor for Dissertation project. Listed in major databases/portals – CBHD, PIR, ExPASy, IMGT...

Post Doctoral Fellow – “Transdermal biosensors for remote biomonitoring.” ■ 2003
Two publications and major conference presentations. Successfully assisted in writing grant proposals for NSF grant renewal.

Post Doctoral Fellow – Molecular Bio-markers for Cancer risk assessment ■ 2000 - 2003
Enzymatic ¹⁴C postlabelling of carcinogen based DNA adducts. [Bio-statistical](#) analysis of epidemiological data sets. Conference presentations and publications.

EDUCATION

University of Madras, Chennai, India ■ 1998

Ph.D. in Biochemistry-Genetics

Dissertation: DNA binding activities of Carboplatin and related anti-tumor platinum(II) complexes

Honors: Dissertation passed “with Distinction”. Peer-reviewed and cited papers

MS University of Baroda, Vadodara, India ■ 1989

M.Sc. in Biochemistry

Thesis: “Genetic basis of Acrylonitrile degradation by microbes from petrochemical effluents”

Bombay University, Mumbai, India ■ 1987

B.Sc. in Microbiology-Botany (Double major)

AWARDS/GRANTS/FELLOWSHIPS

- DAAD International Fellowship, Germany, 1995 (Intl. grant, competitive peer-review)
 - UGC Fellowship, New Delhi, India, 1989 –1994
 - Young Scientist Fellowship Award, IUBMB XVI International Congress, Sep 1994
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RELATED EXPERIENCE

Editor, [Hoya Technical & Research Bulletin](#), Georgetown Univ., Washington DC, 2004 June – Present. Consulting referee to peer-reviewed Journals and grant review (NSF)

Research Interest Group, Research Interest Group in identification of 'theoretical tetrads as gene-regulatory elements', Georgetown University,

RESEARCH SKILLS

Spectroscopic & Physicochemical – UV-VIS, Fluorescence, CD, HPLC; **Molecular Biology** – DNA isolation, purification and cloning; **Bio-potentiometry & Electrochemical**- Enzymatic & antibody biosensors; **Microbiological and related** – Tissue culture, aseptic culture techniques; **Computers and related** – ORACLE 8i and MATLAB.

TEACHING/MENTORING EXPERIENCE

1. Course director - 'Algorithmic approaches to Computational Biology' - [COSC 430](#) - Elective three credit course (Fall 2004) -
 2. Taught credit courses in classical Biochemistry and basic spectroscopy for M.Sc students during graduate program
 3. Actively involved in guiding and mentoring M.Sc, M.Phil students (Univ. of Madras) towards their dissertation/theses.
 4. Trained Lab personnel in the use of HPLC methods and HP Chemstation for LC for peak analysis.
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MEMBERSHIPS

American Association of Cancer Research
Deutscher Akademischer Austauschdienst - Alumni
Myxomycologists of North America
Physarum Plus

PROJECTS/ACCOMPLISHMENTS

- [InstaSeq](#) - A Google powered sequence record locator from around the web.
- [SEQUEROME](#) - development of web based Sequence profiling tools - Project mentor
- Coordinator - Bioinformatics and Computational Biosciences Unit - <http://bioinformatics.georgetown.edu/>
- Micro-fabricated glucose biosensors for an Army funded (DARPA) project using bio-electrochemical approaches.
- Framework for computational biosciences program to the Georgetown University (Drs. Mahendra and Bala, Computer Science Dept.)
- Conceived and responsible for implementing a new onco-biomarker approach using ¹⁴C postlabelling of carcinogen-DNA adducts in human samples.
- Identified a new biopolymer based anti-tumor Pt(II) complex as a drug delivery system.
- Conceived and developed a new pH based method for DNA helix-coil transition studies.
- Created chimeric vectors for design of novel transcription repressors with unique DNA binding sites. Protein engineering project for Acute Promyelocytic Leukemia.
- Experienced in writing for externally funded grants/proposals with 'very good' rating.
- Performed statistical analyses for smoking study sets.
- Communicated results at leading conferences and as papers in peer reviewed journals.
- Guided and mentored M.Sc and M.Phil students towards their dissertation projects and thesis.
- Developed an algorithm to explain selective uptake of white adipose fatty acids during negative energy balance

OTHER ACCOMPLISHMENTS

1. **Editor**, [Hoya Technical & Research Bulletin](#), Georgetown Univ., Washington DC, 2004 .
2. Consulting Referee to peer reviewed journals (*Langmuir*, *Biomacromolecules*, *Cancer Gen. Epi. Biomar.*, *Carcinogenesis*).
3. Paper cited as a reference article by a [global chemical company](#) for work on carboplatin.
4. Co-chaired a committee on Fifth Annual AACR Associate Member Grants Writing Workshop for early career scientists – 93rd Annual meeting of the AACR, San Francisco – April 2.
5. Featured in *Science* magazine (*Science* next wave) [28th March 2003](#).

LIST OF PUBLICATIONS AND PRESENTATIONS

Invited Talks/presentation:

1. "Bioelectrochemical approaches to ELISA development methodology", Inst. of Basic Medical Sciences, Univ. of Madras, Taramani 600113, 13th Sep 2004
2. "Potential application of transdermal biochips for remote sensing by voltammetric techniques" Minisymposium on Biophysics, December 15 2003, Georgetown University, Washington DC - 20057
3. "Biophysical Methods in Structural Biology: Cancer Therapy to Biomakers and Biosensors", [Colloquium](#) at the Computer Science Dept., 26 Sept 2003, 261A Reiss Science Bldg, Georgetown Univ., Washington DC - 20057
4. "Cross-linking Platinum(II) compounds as tool in RNA folding studies", Dept. of Chemistry & Biochemistry, Univ. of Maryland - Baltimore Campus, 25th Nov 2001, Baltimore MD - 21250
5. "Molecular aspects DNA binding anti-cancer platinum (II) complexes", Lombardi Cancer Center, 25th Jan 2000, Washington DC - 20007

Publications/Papers presented:

1. "γ-Radiation-induced chromosomal mutagen sensitivity is associated with breast cancer risk in African-American women: Caffeine modulates the outcome of mutagen sensitivity assay"; Thanemozhi G. Natarajan, [Natarajan Ganesan](#) et. al., *Cancer Epidemiology Biomarkers & Prevention* 2006; 15(3). March 2006
2. "A Bigger BLAST", Editor's featured section NetWatch, *Science* VOL 309, 23 Sep 2005, p-1971.
3. "TGF beta Signaling in Gastrointestinal Stem Cells.", [Science's STKE](#), (Connections Map, as seen September 2005), Krit Kitisin, Tiffany Blake, Yi Tang, Tapas Saha, Nady Golestaneh, Natarajan Ganesan, Lopa Mishra, http://stke.sciencemag.org/cgi/cm/stkecm;CMP_17699 AND Three other peer reviewed submissions
4. "A web based interface for profiling alignment reports of nucleotide/peptide sequences", [Natarajan Ganesan](#) et.al. 2005 *Biotechniques* - 2005, Vol 39(2), pp 186-188
5. "Gold layer based dual crosslinking procedure of glucose oxidase with ferrocene monocarboxylic acid provides a stable biosensor", [Natarajan Ganesan](#)*, Anand P. Gadre, Makarand Paranjape, John F. Currie; *Analytical Biochemistry* 343(1), 188-191
6. "Morphological changes of *C.albicans* in response to Cisplatin treatment: A fluorescence microscopy study using Ethidium bromide staining ", K. Chandrasekhar, R. Malathi and [Natarajan Ganesan](#)* *Annals of Clinical Microbiology and Antimicrobials* 2005, 4:7 (25 April 2005)
7. "Searching the World-Wide-Web using nucleotide and peptide sequences", [Natarajan Ganesan](#) et al. – submitted
8. "DNA adducts containing 7-Alkyl-2'-Deoxyguanosine as surrogate biomarkers for N-nitrosamines from human lung tissues: A ³²P-postlabeling study"; [Natarajan Ganesan](#), Shunji Kato, Elise D. Bowman, Peter G. Shields – submitted
9. "[SEQUEROME](#): A 'Sequence Profiling Tool' for genome and Proteome analysis"; [Natarajan Ganesan](#), Nick Bennett et al., [CBHD](#), 29, Dec 16 2004
10. "Micro-System for Electrochemical Detection – Sensing Transdermally using an Array Technology", A.P. Gadre, Y. N. Srivastava, [N. Ganesan](#), J. Holeman, J. F. Currie and M. Paranjape, [MicroTAS](#), 2, p398-400, Sep 2004.
11. "Polycarboxylates as drug delivery systems for anti-tumor Pt(II) complexes"; [Natarajan Ganesan](#), Malathi Raghunathan & Eggehard Holler; *Proc. Am. Assoc. Can. Res.*, March 2003, Vol. 44
12. "Molecular mechanisms of carboplatin:DNA interactions and MCF-7 cell line toxicity studies provides possible new caveats"; [Natarajan Ganesan](#), Malathi Raghunathan & Eggehard Holler; *Proc. Am. Assoc. Can. Res.*, March 2003, Vol. 44.
13. "Enzymatic ¹⁴C-postlabeling using N-acetyltransferase as a biomarker tool: Extending the limits of detecting carcinogen-DNA adducts"; [Natarajan Ganesan](#), Radoslav Goldman, Jayanta Kumar Mukhopadhyaya, Peter G. Shields; *Proc. Am. Assoc. Can. Res.*, Vol. 43, March 2002.
14. ³²P-labeling Assay of 7-Alkyl-2'-Deoxyguanosine Adducts In Human Lung Tissues: A Molecular Epidemiological Survey; [Natarajan Ganesan](#), Shunji Kato, Stefano Petruzzelli, Elise D. Bowman, Peter G. Shields; *Proc. Am. Assoc. Can. Res.*, Vol. 42, March 2001.
15. "Increased DNA-binding activity of cis-1,1-cyclobutane dicarboxylato diammine platinum(II) (carboplatin) in the presence of nucleophiles and human breast cancer MCF-7 cell cytoplasmic

- extracts: activation theory revisited" [G.Natarajan](#), R.Malathi & Eggehard Holler, [Biochem. Pharmacol. \(1999\) Nov 15; 58 \(10\): 1625-9.](#)
16. "Tumor inhibiting and DNA binding properties of a platinum complex coupled to a bioresorbable polymer" [G.Natarajan](#), R.Malathi and Eggehard Holler,(1998) *MACROMOLECULES NEW FRONTIERS*, Ed. K.S.V.Srinivasan, ISBN 81-7023-760-2 Allied Publishers Ltd., New Delhi, vol. II, p600-602,
 17. "Helix-coil transitions in DNA modified by novel Pt (II) complexes: A pH melting study" [G.Natarajan](#), R.Malathi & Eggehard Holler (1998), [J. Biomol. Str. Dyn., 15\(No:6\), p1173-1180](#)
 18. "Helix-coil transition studies in DNA using pH variation method: Case of a melting paradox as a function of ionic strength" [G.Natarajan](#), R.Malathi & Eggehard Holler (1996), [Anal. Biochem., 237, p152-155.](#)

Poster Presentations:

1. "Fabrication of a Multi Polymeric Bio-Integerable Transdermal Sampling Deivce", A.P. Gadre, Y.N. Srivastava, N. Ganesan, M. Paranjape and J.F.Currie, [MEMS in Homeland Security, Defense and Aerospace applications](#), Spring 2004
2. "Molecular epidemiology of Breast Cancer: Development and validation of acetylation methods for carcinogen adduct detection", Peter G. Shields, K. Turteltaub, Goldman R., and Natarajan Ganesan, 'Era of Hope' DOD breast cancer research meeting, Sep 25th-28th 2002.
3. "Is Carboplatin activated before reaching its target sequences? ", G. Natarajan, R. Malathi & Eggehard Holler, [11th conversation in Biomolecular Structure and Dynamics;, June 1998.](#)
4. "Selective uptake of white adipose tissue fatty acids during negative energy balance: a novel mathematical approach" at the *XVI International Congress of Biochemistry and Molecular Biology* (New Delhi, Sept 19-22, 1994).